

REMARKS

Claims 1, 3-6, 9 and 11-14 are pending in this application. By this Amendment, claim 1 has been amended to incorporate the features of claim 2 as well as features similar to those recited by claim 8. Claim 6 has been amended to incorporate the features of claim 8 including intervening claim 7. Further, claims 13 and 14 have been amended similarly. Claim 9 has been amended to change its dependency. Claims 2, 6, 7 and 10 have been correspondingly canceled. Thus, no new matter has been added.

I. Allowable Subject Matter

Applicants appreciate the indication that claims 4, 11 and 12 contain allowable subject matter. Applicants respectfully submit that all pending claims are also allowable for at least the reasons presented herein.

II. 35 U.S.C. §§ 102 and 103 Rejections

The Office Action rejects claims 1, 6, 13 and 14 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,318,369 (hereinafter "Cronyn"), and rejects claims 1-3, 5-10, 13 and 14 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,827,047 (hereinafter "Qian") in view of Cronyn or DE 19931104 (hereinafter "Fischer"). Claims 2, 6, 7 and 10 have been canceled rendering the rejection with respect to these claims moot. The rejections with respect to the remaining claims are respectfully traversed.

Cronyn, Qian, and Fischer, taken in any combination, fail to disclose or render obvious "wherein the fuel supply control means allows the hydrogenated fuel to be supplied to the internal combustion engine **only when the necessity for fuel supply is recognized and the dehydrogenated product cannot be supplied,**" (emphasis added) as recited by claim 1, and as similarly recited by independent claims 6, 13 and 14.

Cronyn discloses a recyclable-fuel engine system for a vehicle that includes a hydrogen-producing catalytic unit that when supplied with heat, catalyzes a reduced form of a

hydrocarbon carrier to form hydrogen and a dehydrogenated form of the carrier. The hydrogen produced in the catalytic unit is supplied to the engine as a power source.

Cronyn discloses an apparatus 10 that includes a fuel tank 20 that is divided into two variable volume compartments 128 and 130 by way of the flexible divider 126. Compartment 128 (alleged hydrogenated fuel storage section) stores the saturated hydrocarbon carrier and the compartment 130 (alleged dehydrogenated product storage section) stores the dehydrogenated form of the carrier produced as a result of the saturated hydrocarbon undergoing a dehydrogenation reaction in the catalytic unit 14. (See col. 7, lines 40-45). Cronyn discloses that the apparatus 10 is "refueled" by removing the dehydrogenated form of the carrier from compartment 130 and refilling compartment 128 with the saturated hydrocarbon carrier.

However, the internal combustion engine disclosed by Cronyn is only adapted to use hydrogen as its fuel source (see col. 3, lines 26-28). Cronyn specifically discloses that the hydrogen gas produced by the dehydrogenation of the saturated hydrocarbon is pressurized and passed through gas-filtration tanks 28 that purifies the hydrogen gas. The purified gas is then supplied to a fuel injector 32, where it is mixed with air and injected into the engine. (See col. 3, lines 49-53). Cronyn fails to disclose that either the saturated hydrocarbon or the dehydrogenated form are supplied to the engine as fuel.

Further, Qian fails to disclose or render obvious, alone or in combination with Cronyn, "wherein the fuel supply control means allows the hydrogenated fuel to be supplied to the internal combustion engine **only when the necessity for fuel supply is recognized and the dehydrogenated product cannot be supplied**," (emphasis added) as recited by claim 1, and as similarly recited by independent claims 6, 13 and 14.

Qian discloses providing both reformed liquid fuel (dehydrogenated liquid fuel that is rich in aromatic compounds) and the reformed gaseous fuel that is rich in hydrogen to an internal combustion engine.

Qian discloses various embodiments for supplying reformed liquid fuel (dehydrogenated liquid fuel) and/or reformed gaseous fuel that is rich in hydrogen gas to an engine. In a third embodiment, Qian discloses mixing unreformed liquid fuel and reformed liquid fuel in various ratios and supplying the mixture as fuel to the engine. The amount of unreformed fuel and reformed fuel contained in the mixture is regulated by regulator valves 40 and 47. Qian disclose that the reformed liquid fuel (i.e. liquid fuel that has undergone a dehydrogenation reaction) has a higher octane rating as a result of the increase in the amount of aromatic hydrocarbons present in the fuel. Thus, Qian discloses that the regulating valves 40 and 47 provide the function of increasing the proportion of the reformed liquid fuel having the higher octane rating when the engine is operated under a high load, and conversely, increasing the amount of unreformed liquid fuel when the engine is operating under low load. (See col. 8, line 57 - col. 9, line 5).

Thus, Qian discloses varying the amount of unreformed liquid fuel supplied based on engine load conditions, but fails to disclose supplying the unreformed liquid fuel to the internal combustion engine only when the necessity for gasoline supply is recognized and the dehydrogenated gasoline cannot be supplied. Under low engine load conditions, Qian discloses supplying a proportionately larger amount of unreformed fuel even though the reformed fuel continues to remain available for supply.

Further, Fischer fails to cure the deficiencies of Cronyn and Qian.

Therefore, independent claims 1, 6, 13 and 14 are patentable over the applied references in any combination. The dependent claims are patentable for at least their dependency from claim 1 or claim 6 as well as for the additional features they recite.

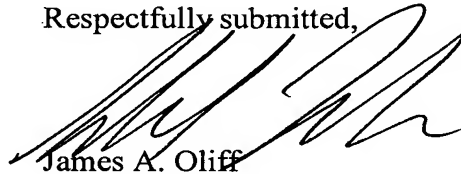
Accordingly, withdrawal of the rejection is respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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